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PATENT APPLICATION  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE 12800 MAIL ROOM (9)

3-13-02  
JLH

In re application of

ALMANTAS GALVANAUSKAS, et al.

Appln. No.: 09/042,666

Confirmation No.: Not yet assigned

Group Art Unit: 2874

Filed: March 17, 1998

Examiner: J. LEE

For: ULTRASHORT-PULSE SOURCE WITH CONTROLLABLE WAVELENGTH OUTPUT

*considered*  
*JDL*  
**SUPPLEMENTAL RESPONSE**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Further to the Response filed in the subject application on March 5, 2002, Applicants submit this Supplemental Response in order to present a number of references from the literature in support of the arguments previously submitted. The textbook references by Shen<sup>1</sup> and Diels<sup>2</sup> are submitted in support of the discussion in the prior Response relevant to the distinctions to be drawn between and among parametric amplification, parametric oscillators, and parametric generators. For example, a good introductory discussion of optical parametric generators appears at pages 281 and 282 of Diels. Similarly, a useful introductory discussion of parametric oscillators appears on page 120 of Shen [1]. Shen [2] contains a very useful discussion of all three-frequency interactions (sum, difference, parametric) beginning at page 94.

The remaining journal articles to Nishikawa et al, Seilmeier et al, Kung and Rabson et al are submitted in support of the "unexpectedness" result obtained according to Applicants'

<sup>1</sup> Shen, The Principles of Nonlinear Optics, Wiley and Sons, 1984; Shen, Nonlinear Infrared Generation, Springer-Verlag, 1977.

<sup>2</sup> Diels, Ultrashort Laser Pulse Phenomena, Academic Press, 1996.

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invention of radically reducing the threshold for parametric generation (superfluorescence). For example, in Nishikawa et al, an exotic configuration designed to produce input pulses with a peak power of 8.4MW was used "because the 28kW peak power of (a dye laser alone) is not sufficient to generate parametric superfluorescence". Note also the use of 4ps pulses of 100MW peak power used in Rabson et al. Note also the power density described in Kung of  $10^9$  W/cm<sup>2</sup>. Seilmeier and Kung are also useful for their discussion of the estimate of exponential gain. The foregoing power values are to be compared with the presently disclosed parametric generation threshold of a few hundred watts achievable through the invention.

Applicants submit that the state of the art, as represented by the references submitted herewith and those already of record in this application, clearly are not suggestive of the attainment of this dramatic reduction in parametric generation onset. To the contrary, they clearly support the traditional thinking that megawatt-regime powers are necessary to support parametric superfluorescence.

Applicants kindly request that the present response and the supporting references submitted herewith be considered together with the primary response made of record on March 5, 2002.

Respectfully submitted,



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